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16 September 1954

SUBJECT: Tooting of Oppor Atmosphere Focket Research Fanel

le At the invitation of Air Force Scientific Advisory
Board, I attended a moting of the Upper Atmosphere Socket
Research Parit on S hestosbor at the lavel recent Laboratory,
Amocostia, the two americalities of privary concern versa

1) Sigher Altitude and attaillite Vehicles, 2) International
Geophysical lacer, and the logistics therefore

- 2. This panel was formed in 1963 by representatives of verious organizations which were exceeded with upper atmosphere research through receive. It is chaired by 'r. James & Yan Allen who is their an of the impartment of thysics, state interestly of form. The proof has received from abordeen crowing through, minorally of their and tendent laboratory, air force tendridee the crimic forwary, have research interested from a facility in the faction of vectors, and irrest the content of the content of the second former. Although the informally supported by the officers or animalism but is informably supported by the officers of anythe content in the information with the forthcoming function of coversation that has been explaned the function of coversation the union of light altitude recests.
 - 3. At the S reptember meting, there were in addition to the panel itself, representatives from the chief of underson, inited takes any, the redston aromal, the land Corporation, the office of seval research, herophysics evelopment temperation, Air lores ANG, HAMA, harboral beimnes roundation, etc.
 - them it is a way and antilities which are the first agendated past upper characters research with recents. As cited the entersive are of the which could carry 2,100 pounds peyload to entersive are of the which could carry 2,100 pounds peyload to entersive are of the which could carry 2,100 pounds peyload to a look at the appropriate thich was not used entersive. The maintenant of the mid-look at the appropriate thich was not used as a simple size of whiche, principly because it could carry only be a simple to an attribute of the niles. The appropriation with the vertical actions of a simple carry of the conduction of the conduction

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- Board, I attended a moting of the Upper Attemphere inchet Research Peril on 3 tentember at the lavel recearch laboratory, American alternative and attended item of printry concern were.

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- the freeze the opened the discussion of the first epochs
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eltitude and in its forthessin; podification will carry 500 points to 195 miles eltitude. The second rocket is the acrobes which can carry 190 pounds paylored to 65 miles ellitude. In addition to those two, there is then the hard which is a system of launching a resear rocket from a "majoris" balloon. The launch is more at a follown altitude of approximately 190,000 feet and the rocket carries 30 pounds of instrumentation to an altitude of 60 miles. The familian concluded his presentation by stating that, from here on, civilian upper atmosphere rocket research will probably be described, due to lack of civilian funds, upon the military rockets buing seveleded now by the femanticant of follows. The first seveleded now by the femanticant of follows. In then improduced the first higher of two femanticant of follows.

- 5. Ir. Thirds stated that the interests of civilien research and of the Ir an east of Thierso in UV are synonymous. In pointed cut the rain science which have ambiented to civilian science and to defense. Which have ambiented to civilian science and to defense. These include the response to extremely, color-terrestrial relations, for altre-violet and F-ray memories, etc. In described the UV sequence to being in three-phases as follows:
 - (1) The clading in orbit of an abservable object (uninstrumence) which could be seen either optically or by reads.
 - "en unconed chysical laboratory". This place will be a promotive chysical laboratory". This place will be a promotive chysical laboratory". This place will be a promotive chysical laboratory with a very shall vehicle stallar to the chimer will the schieved as righer and equipment. An error plants are developed. These latter will prohably be madeon or solar energy plants. Instrumentation starting with simple relative termination prohably to madeon or solar energy plants. Instrumentation starting with simple relative termination and ripolly a telescope combicated starts with television and ripolly a telescope is included. An less stage in this phase will be a remote controlled vehicle.
 - orbit of a named satellita vehicle.
- orbit was in lower two first step in the process, we stated that such a value is even without instrumentation could produce useful scientific results such as air consist data and relative positions on the craits. The main mobiles in connection with a site of these 11 to 110 of observation from the crath, which will require much such. This problem will be simplified if the lift on either an equatorial or a polar orbit. In regard to



the unnamed instrumented vehicle (these 2), he said that the main problems will be development of small reliable power plants; television, the technical design of which is already well along orientation of the vaniele itself and of the instrumentation corried; and constant reduction of weight of the equipment to be carried. In stated that the altitude at which the vehicle should orbit will depend upon the surpose envisages. Theoretically, on altitude of 1,000 miles at a speed of 5 riles per second would be ideal. This would provide a 2-hour orbit.

- 7. It. Circ Conno Cover of the Hr Deench, City, made the next presents .100, comenum min altitue venicle projects with which TR is cornerned. TRI has three rain projects in this field, the first of which is the development of a nerved conventional eircraft to operate et a reptime altitude of 300 miles. Two designs are presently under consideration - the Loughes 553 and the "curles the forcer is designed to have an altitude of 700,000 feet. Cotes this field of study is covered in deport N-077-12(6(37), "Lish /littado and High Speed Study" by douglas Aircraft becaretion. Confidentially. The encound this project is development of a mound high allitude belloon to operate at 100 to 2 Name forth - the system would be based on the "Ukyhook" polyethylene talleon correins a general equipmed to custain one or two men. ... o ... its: 12 project is for remed ensee flight and the though of this is being conducted at the sero Jet laboratory. The first wasse of this latter project is called 1993, the purpose of which is to place on by in orbit at an altitude of 200 miles in order to memore miscrological and atmospheric data at that byel as the livet store toward alcher altitude work. Project gimhas been dentably deproved by the livry and off is going ahood with it in commercian with the true. It is now also being coordinated with the imporce at a very high levels The project calls for the upo of the first Accistone results (see para. 8 below) es the first energ with the loki cluster (see sers, 9 below) pro-viding the second and third steres. Under Lero Jet lescerable, four substitiery studies are plaused to be uncertaken as follows:
 - (1) A Picibility Study to determine the size and weight of the vehicle required at an altitude of 500 miles. It is hepot that its fred whipple will be the leader of this.
 - (C) In Orbital Study to determine the power required, the quidance species, etc. It is hoped that Ir. 5. Fred Sinjer of the privarity of saryland will lood this.
 - (3) A language trajectory Study to determine the final design and the challing requirements.





(h) A Laimbhin. Study to determine where and how the vehicle should be launched, the logistics requirements, and the range risks involved.

Following the completion of thece four strains, construction of the sected which will be commanded all completes that successful completion of Project. It will lead into the leutching of a webscle straiter to the larger that, i.e., an insurumented webscle using a polar cruit at an altitude of 200 files. It is expected that it is result remain elect for ten days while Into could probably maintain the cruit for about one remains at other, cover expansion that it educate backing is evaluable for project Into probably well to read curing the International decomposes from the first proof at the first in leurobing an it was raid that Project Into takes being the first in leurobing an it was raid that Project Into was absolutely essential to echieve this end.

- Recatons there is recently there is the process of the miles of the period of the miles with a received delighted is not the period of the period
- coserible of a second of implementation and implementation as an air commentation that representation the representation of the receiver of the incidence of the receiver of the incidence of the constitution the second state.

 It has a second of the 10 and a serious of 10 pounds, inchanged writingly from an alumina of how a foot, it is desired to contain the second state of the niles. It is plusted to use of the second state of the prince of the second state of the prince of the second state develops to riles. The second state develops has use a contain the second state develops and the second to a second state of the second incident. It is an elected that the second state of the condition of the second state of the second incident.

 If the point is a second to carry 12 pounds of reflected to a second state of the condition of the second state of the second state of the condition of the second state of the second second state of the second second
- 10. The addition of the communical brighty on a design which they are communical communication the like booster as the first strip and a green resent as the second stage. It is estimated that this we help could attain an altitude of help,000 feet. It would be very less cost, in the renge of 17,000 to 1,000.



and the of the fatternal forces Tourstain gave a brief econers of anasomator of the land for effer evenerative reciet research. the dillies, time-amount thrusand delicrs is presently available and arous 70, "of this will be transferred limedictely to GPT for procurement and accounting purposes. The balance of the rocket project this = .600,000 - will become Available next year.

12. Following adjournment of the panel moting, I spent a week couple of hours with the for alleng that had been defen to for a a time during world for the Wan witen who one of the key figures in the consignment of two M Ace uner hirdred Parsons and imp one of the ordinary excland to increase the first to the recific Heat. In our conversation, i mentioned the difficulty that egy workly would be reconnected in the . Of program, of resigning scientific compount which rough stand the high ${
m d}$ ${
m s}$ one-saftered ${
m T}$ in most with sitilize recicle, rerulcularly with solid propellant. I mentioned swelllerly the Mad Us covered in stage two left will. the local cluster was clearly and all a sale tint there chould to no men difficulty. — to pointed out that the "" Arse contained ", fire miniature resta scheepe biditey and a transmitter, and that w tids inclination, with investably no fellures; thillatood 20,000 - ate vien fired aren tile verel i sinch des le areste qui l'écoloted out also that in the little lighten unless that the in the for rome time, the technique relatives planeaukismi inclumentation for courte for response a translation of the contract of the contr said that he say no bifficulty materown in a sprining instrumentation 200 liilja elvivajo mereto arrionaliakki ecej 17 Tidabandi 1,000 kloral i in recent to the a there personally, he arread therewisly with Lie dere seever, that the interactive fliest stee was to leaved a slugation fold that if the law law law conservationity could be t established, with mirrors are controllly aroutsics blen level. eclosistic repurpie could almost correcting to possible to set a slug in orbit by the time of the II end possibly even fot up an instrumnted venicles

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